Abstract

Research Paper: Cardiorespiratory fitness, cardiac function, and hemodynamics in males and females

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Objective: Physiological sex-differences have been identified in regard to cardiovascular function and cardiorespiratory fitness (CRF). The subendocardial viability ratio (SEVR) is a measure of diastolic dysfunction and coronary perfusion. Diastolic dysfunction occurs due to a shift in the systolic and diastolic pressure time indices. This shift is influenced by increased arterial stiffening, measured via Augmentation Index (AIx), which increases the speed of pulsatile waveforms from systole. However, it is unknown if there are sex-differences in SEVR and Augmentation Index (AIx). **Purpose**: To examine sex-differences in SEVR, CRF, and AIx in apparently healthy adults. **Methods:** This was a cross-sectional study from the Ball State Cohort to assess sex-differences in SEVR, CRF, and AIx. Adults aged 18 and older were included in this study. Individuals must have a cardiopulmonary exercise test within six months of their respective pulse wave analysis (SphygmoCor, AtCor Medical, Sydney, Australia), and meet the maximum test criteria set by the Clinical Exercise Physiology program at Ball State University for inclusion. **Results:** 265 adults (138 Females, 127 Males) met the inclusion criteria. Unpaired two-tailed T-Tests ($P<0.05$), were used to determine differences between males and females. SEVR (155.78 ± 30.13, $P<0.05$), Vo2mL/kg/min (31.99 ± 12.27, $P<0.05$), Vo2L/min (2.48 ± 12.27, $P<0.05$) were higher in males. Aortic AIx (124.77 ± 14.57, $P<0.05$) was lower in females compared to males. **Conclusion:** Both SEVR and CRF, were higher in males versus females, However, AIx was elevated in females when compared to males within the Ball State Cohort. These findings suggest that higher CRF may be associated with higher SEVR which indicates greater coronary perfusion in males compared with females. However, higher aortic pressures (AIx) seen in females may cause a reduction in coronary perfusion due to elevated pressures within the aorta.